

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
24 June 2004 (24.06.2004)

PCT

(10) International Publication Number
WO 2004/053585 A1

(51) International Patent Classification⁷: **G02F 1/1345**,
G09F 9/35, H01L 21/603, 23/485

Gyeonggi-do (KR). **KANG, Sung-Chul** [KR/KR];
164-1001 Hyundai Seongwoo 2cha APT., Sanghyun-ri,
Suji-eup, Yongin-si, 449-843 Gyeonggi-do (KR).

(21) International Application Number:
PCT/KR2003/002662

(74) Agent: **PARK, Young-Woo**; 5F., Seil Building, #727-13,
Yoksam-dong, Gangnam-gu, Seoul 135-921 (KR).

(22) International Filing Date: 5 December 2003 (05.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10-2002-0078017
9 December 2002 (09.12.2002) KR

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO,
CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB,
GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG,
KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT,
RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (*for all designated States except US*): **SAM-
SUNG ELECTRONICS CO., LTD.** [KR/KR]; 416, Mae-
tan-dong, Yeongtong-gu, Suwon-si, 442-742 Gyeonggi-do
(KR).

(84) Designated States (*regional*): ARIPO patent (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,
SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

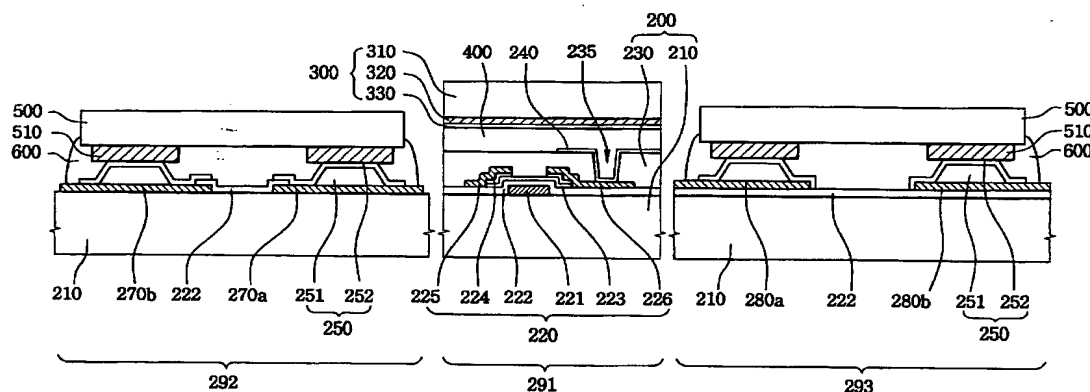
(75) Inventors/Applicants (*for US only*): **HWANG**,
Seong-Yong [KR/KR]; #7-1 Nongseo-ri, Giheung-eup,
Yongin-si, 449-901 Gyeonggi-do (KR). **OH, Weon-Sik**
[KR/KR]; 204-802 Unam Jugong APT., #920-2,
Osan-dong, Osan-si, 447-010 Gyeonggi-do (KR).
YOON, Ju-Young [KR/KR]; 402, Seonghyeongwan
Wolgyesu, Nongseo-ri, Giheung-eup, Yongin-si, 449-901

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: THIN FILM TRANSISTOR SUBSTRATE, METHOD OF MANUFACTURING THE SAME, LIQUID CRYSTAL DIS-
PLAY APPARATUS HAVING THE SAME AND METHOD OF MANUFACTURING THE LIQUID CRYSTAL DISPLAY AP-
PARATUS



(57) Abstract: A conductive bump including a plurality of protrusion members (251) and a conductive layer (252) formed on the protrusion members is disposed on a TFT substrate (200). Each of the protrusion members is disposed on an electrode pad (270y, b, 280c, b) in a pad region (292, 293) of the TFT substrate, and the conductive layer is electrically connected to the electrode pad. A non-conductive resin (600) is disposed on the conductive bump, and a driving IC (500) is thermally compressed on the conductive bump. Therefore, the electrical contact characteristic between the driving IC and the electrode pad is improved.